Study of the Parameters Influencing Brightness of Luminescence of Minimal Resistance Points

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Introduction:

Animal and human skin is known to have points with low electrical resistance.[1-4] Analogous points have been found on plants and insects.[5-6] Human skin retains electrical heterogeneity that may be detected several days after death. Due to autolytic processes in cells after death, the physical parameters of the skin are gradually equalizing and electrical heterogeneity is gradually disappearing.[3-4]

In terms of Traditional Chinese Medicine these low resistance points are described as Acupoints where Qi penetrates the skin. Modern study revealed that sites of Acupoints had complex structure beneath the skin with weak connections between the cells allowing for the interaction of the body and the environment (fig. 1).[7-9]

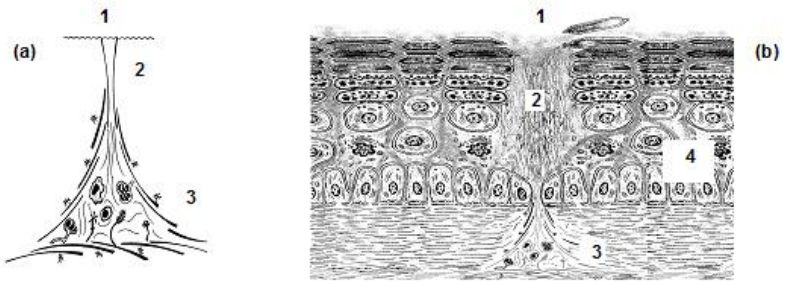

Figure 1. Chart of the acupoint (a) and skin (b):
1) Skin surface: «exit – entrance» of acupoint,
2) Channel of acupoint,
3) Various elements of «active part» of acupoint,
4) Cells and intercellular spaces of the skin.

In terms of electrical characteristics, a human skin may be described as a multi-layered dielectric alternating with conductive layers of which a keratinized epithelium of the surface has the most resistance. The connection between epithelium cells is weaker in acupoints, thus providing for the channel connecting skin surface with the active zone of the point. The conductivity of the “point channel” and the conductivity between the points alongside the same Regular channel depend on the energy level: the higher the energy level, the higher the conductivity and vice versa.[1-2]

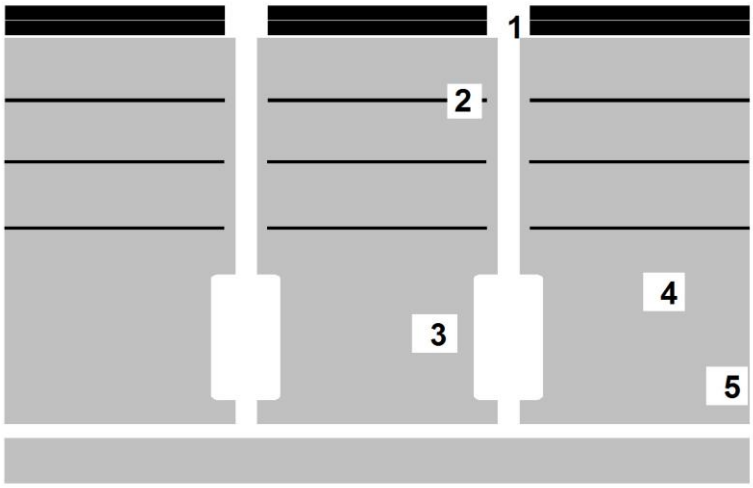

Figure. 2. Chart of electrical properties of the skin:
1) Skin surface, a «gateway» of the point channel
2) Channel of the point
3) Active zone of the point
4) Skin cell elements and intercellular space
5) Main channels connecting active zones of the points

2. *Physical Significance and the Order of Visualization of the Least Resistant Points*

AcuVision device was developed in the early 90th in order to visualize the points of the least resistance in a high voltage field of corona discharge.

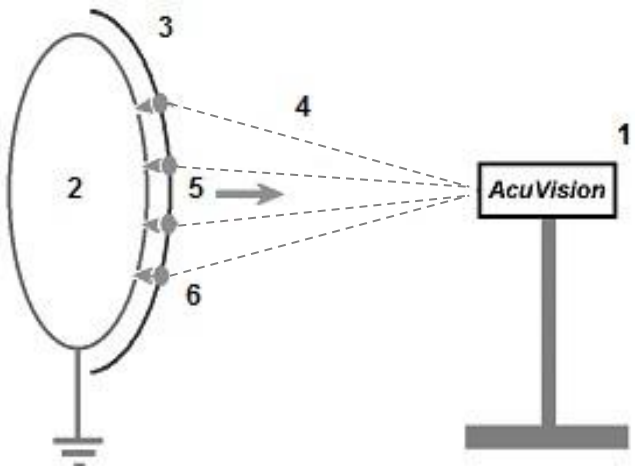

Figure 3. Physical principle of visualization of local skin conductivity:
1) Active (positive) electrode of “AcuVision” device
2) Grounded bio-object or patient
3) Dielectric (polyethylene or cotton tissue),
4) Lines of forces of corona discharge,
5) Direction of negatively charged ions and electrons,
6) Luminosity on dielectric in the points of increased conductivity

"AcuVision" aided examination is carried out as follows:

A patient or another bio-object or a model are grounded by a special electrode (a "zero" electrode). Once the device is turned on a high voltage corona discharge is generated between the active electrode and the grounded bio-object, with lines of forces directed to the points of the least electrical resistance on the object's surface. If the surface of the examined subject is covered by dielectric (such as polyethylene film or a paper towel), it causes "breaks through" dielectric generating weak bluish stimulated luminescence (see figures 3 and 4).

Application of AcuVision device demonstrated the presence of low resistance points on the surface of any live subject [1993−1994]. It was also demonstrated that in case of channel deficiency (e.g. in the patients with paralysis due to spinal trauma) no acupoints could be visualized on the patient's legs by AcuVision [1995-1996]. The study by a group of masters demonstrated that Qi Gong practitioners could change conductivity of hand and auricular acupoints [2000].

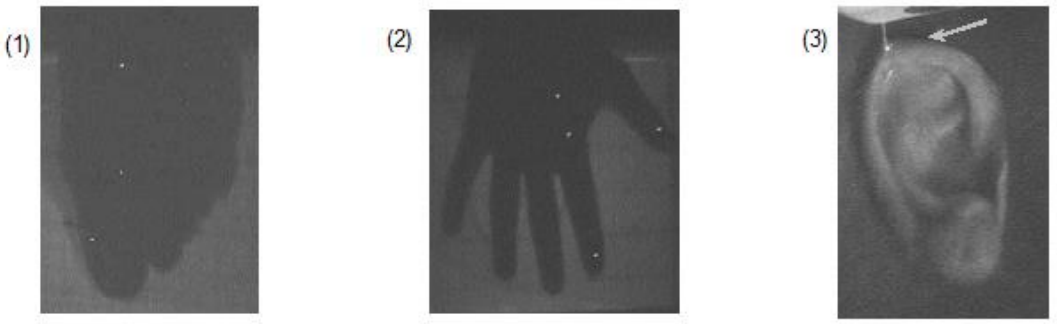

Figure. 4 Examples of low resistance point visualization:
1) Acupoints on the right foot,
2) Acupoints on the back surface of the left hand,
3) Auricular point of the corpse (1 day after death).

Materials and Methods

In 2007 we have conducted experiments to study the parameters influencing the degree of luminescence.

In our study "AcuVision" device[10] manufactured by Coloyaro-2000 Ltd and Graviton Ltd was applied. It was a microprocessor controlled high-voltage pulse generator. Maximum voltage between active and "zero" (ground) electrode was 24000 V; max electrical current between electrodes was 100 mkA. We applied positive active electrode to achieve the movement of negative air-ions and electrons from the experimental body surface toward the active electrode (fig. 3).

The experiment was conducted on a model simulating skin with high resistance with focal points of high conductivity. A 5 mm thick dielectric plate [Plexiglas: resistance ~ $5 \cdot 10^{12}$ Ohm) with 1 mm holes was used as a model. Copper electrodes of a uniform diameter (of the electrode body) were inserted into the holes. One of the flanks of 2 electrodes was fitted with different diameter extensions, like a head of a nail.

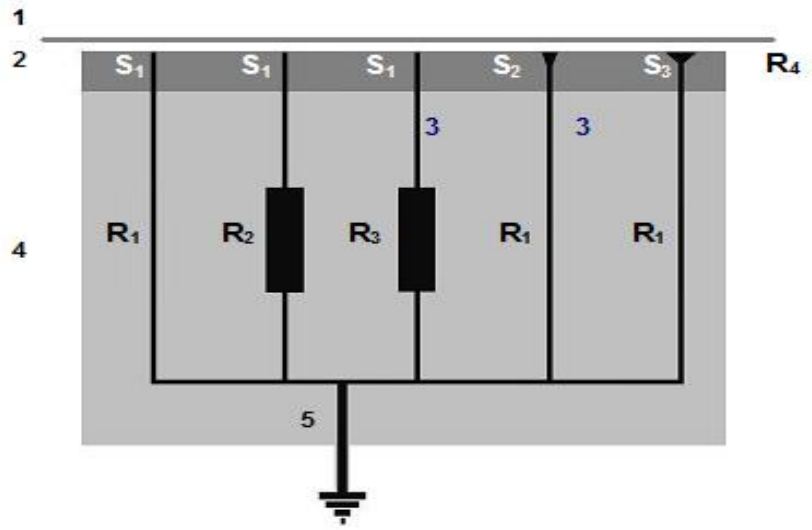

Figure. 5 Electrical model for skin simulation used in the experiment
1) Thin dielectric on the skin model surface,
2) Thick dielectric (Plexiglas) imitating skin (R_4),
3) Electrodes with different surface areas (S),
4) Resistors of different resistance (R_1– R_3).
5) Grounding electrode.

The surface or the dielectric plate with electrodes inserted (heads up) was covered by a dielectric [polyethylene film; permittivity (ε) ~ 2.3]. Opposite ends of the electrodes were connected to the zero (grounding) electrode of AcuVision device.

The distance between the positive electrode of AcuVision device and the surface of dielectric was constant (20 mm).

Current passing through the electrode was measured and displayed on the front panel of the device. The device scale of 100 mkA range is divided into 10, with each point equaling approximately 10 $\pm$ 3 mkA.

Due to weakness of luminescence, the test was conducted in a dark room. A slight red light that did not interfere with the perception of a blue luminescence could be used additionally. The voltage between the active and the zero (“ground” electrodes was regulated with “Level” handle on the front panel of the device, as well as by adding consecutive resistor between the zero electrode and the electrode inside the dielectric simulating the skin. A digital camera recorded luminescence on the dielectric.

The First Part of the Experiment:

A spot with a stimulated bluish luminescence appeared on the dielectric covering the skin simulating material once the device was turned on. In the beginning of the experiment “Level” handle was in the extreme right position (set on voltage of 24000 V).

After that the “Level” handle was turned left to reduce the electric current on the zero electrode and the electrode inserted in the skin simulating material and the luminosity decreased accordingly. Thus the current 80 mkA corresponds to the luminosity on photograph # 1 (photos will be demonstrated during presentation); current 60 corresponds to the luminosity on photograph # 2; current 40 corresponds to the luminosity on photograph # 3.

Second Part of the Experiment:

The “Level” handle was in the extreme right position (set on voltage of 24000 V).

Consecutive resistors reducing the electric current on the electrodes were added between a zero electrode and the electrode inside the dielectric simulating the skin. Additional resistors reduced the electric current, and thus reduced the intensity of luminescence.

1) Without resistor: the current was 80 mkA that corresponds to the luminosity on photo # 4.

2) Resistor 30 Mega-ohms: current was 70 mkA that corresponds to the luminosity on photo # 5.

3) Resistor 60 Mega-ohms: current 60 corresponds to the luminosity on photo # 6.

Third Part of the Experiment:

Electrodes with flanks fitted with an extension, like a head of a nail were used to evaluate the relationship between the intensity of luminescence and the surface of the conductive surface. The electrodes used had the following diameters of conductive surfaces: 1 (S_1); 3 (S_2) и 5 (S_3) mm. The ends of the conductors were connected with the grounding electrode on the inside. The “Level” handle was in the extreme right position (voltage of 24000 V).

The relationship between the electric current passing through the electrodes and different electrode surfaces was studied at the first stage of the experiment. It was found that the current did not depend on the dimensions of the conductive surface and was the same as in the first experiment.

The second stage of the experiment evaluated the relationship of intensity of luminescence and the size of conductive surface of an electrode, while the material simulating skin was covered with a thin dielectric (polyethylene film). It was found that a point luminescence on the dielectric was approximately of the same intensity notwithstanding the electrode surfaces: diameter of the conductive surface of 1 mm (photo # 7); for the diameter of the conductive surface of 3 mm (photo # 8), for the diameter of the conductive surface of 5 mm (photo # 9),

Conclusions:

The conclusions based on the above experiments:

1) AcuVision device visualized the points of the least resistance on the surface of dielectric;

2). Brightness and dimensions of the luminescent spots depend on the current passing through the areas of increased conductivity;

3) The brightness and the dimension of the luminescent spots do not depend on the size of the conductive spot.

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